

METHOD AND APPARATUS FOR BINDING PAPER SHEETS AND SIMILAR MATERIALS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates generally to document handling, and more particularly to an improved method and apparatus for permanently binding a plurality of paper sheets and similar sheet-like materials.

2. General Background

The collection of papers, photographs and similar materials into a permanently bound volume is performed on numerous occasions and in a wide variety of venues in the home, office and school. This activity has increased significantly as a result of the widespread use of computers and their associated printers that can produce text and visual information, such as photographs, graphs, charts, tables, data printouts, drawings and the like, both rapidly and at a low cost.

It is often desirable or necessary to collect related sets of such documents in a binder, volume or the like. For example, sales reports and financial data sheets produced by a computer are often collected together in some form, such as in a loose leaf binder, for later easy reference. Similarly, the amateur photographer often desires to collect a group of photographs, such as those taken during a vacation, in a bound volume. However, the loose leaf binder in which the collected documents can be inserted and removed, and thus lost or damaged, may not be suitable for use in many situations in which a permanently bound volume of documents is more desirable.

The numerous prior attempts to achieve a permanently bound collection of papers and other documents are indicated in the many issued United States patents in this field of activity. Typical of this prior art are US Patent Nos. 3,940,904; 5,678,861; 5,683,111; 5,836,615; 5,692,866; 5,727,816; 5,437,476; and 5,791,690.

There are, however, numerous drawbacks with the prior approaches to this problem, the more significant including the high cost and complexity of the equipment required, which makes the prior art binding techniques unsuitable for most home and office binding operations. In others of the prior art systems for binding sheet-like materials, accurate alignment of the bound sheets may be difficult to achieve, and in yet others there is the possibility of the volume not remaining bound permanently, which could result in a loss or damage to the loosened documents. In addition, many of the previously binding systems are only suitable for use in binding sheets having certain dimensions or only with certain materials.

SUMMARY OF THE INVENTION

It is accordingly an object of the present invention to provide a method of binding paper or similar sheet-like materials into a permanently bound volume, which can be used with papers of varying dimensions and with a wide variety of types of document.

It is a further object of the present invention to provide a method of permanently binding papers in a relatively simple and inexpensive manner that does not require the use of complex and costly apparatus.

It is another object of the present invention to provide a method of the type described which is useful in binding together a large number of computer printouts and similar documents.

In the method of the invention, each paper or sheet to be bound is provided along one edge with an adhesive strip initially covered with a releasable protective strip or cover. Each sheet is also provided with aligning openings along the same edge. To assemble these documents into a permanently bound volume, the protective strip is removed from the sheet. The sheet is then placed over an alignment guide, which includes alignment members in registration with the alignment openings in the paper. The sheet as thus positioned lies over a previously positioned sheet and can adhere to it by means of the adhesive strip along its inner edge adhering to the inner edge of the underlying (or overlying) paper. The process is repeated until a volume containing the desired number of sheets adhered to one another is formed. In one embodiment of the invention herein described, the alignment guide is in the form of a guide board that includes a number of upstanding rods or pegs that are positioned on the base of the board to align with the aligning openings in the papers.

DESCRIPTION OF THE DRAWINGS

To the accomplishment of the above and such further objects as may hereinafter appear, the present invention relates to a method for permanently assembling a plurality of sheet-like materials into a bound volume, substantially as defined in the appended claims and as described in the following specification as considered with the accompanying drawings in which:

Fig. 1 is an elevation of a sheet of paper showing the partial removal of the releasable protective strip in accordance with one step in the method of the invention;

Fig. 2 is a perspective of a guide board that may be used in the performance of the method of the invention;

Fig. 3 is a perspective illustrating the placement of a sheet of paper over the guide member of Fig. 2, in accordance with another step of the method; and

Fig. 4 is a perspective, partly broken away, of a volume of paper sheets bound together by the method of the invention.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now to the embodiment of the invention illustrated in Figs. 1-4, there is shown in Fig. 1 a typical sheet of paper 10, which can be used to form a bound collection or volume of such documents in accordance with the invention. It will be understood that the method of the invention may be used with a wide variety of sheet-like materials of varying sizes and shapes other than paper, such as cloth, and may be in the form of, for example, computer printouts, photographs, graphs, printouts and the like.

A strip 12 of a pressure-sensitive adhesive is arranged by any known technique over one, here the left, edge of the sheet 10 and a releasable protective layer or strip 14 is removably secured to the adhesive strip 12 to prevent the adhesive strip from bonding to another sheet until the protective layer is removed. As shown, alignment holes 16, here shown as three in number and equally spaced, are formed in sheet 10 and in adhesive strip 12, and optionally in protective strip 14 as well. The present invention provides a reliable and simple means for assembling a plurality of sheets 10, as modified in the manner shown in Fig. 1, into a permanently bound collection or volume, as shown in Fig. 4.

To this end, the loose, individual sheets 10 are assembled on a guide board 18, one embodiment of which is shown in Fig. 2. As therein shown, guide board 18 includes

a base 20 to which a plurality of upwardly projecting guide pins 22 are secured at their lower ends. The location and spacing of the guide pins 22 are the same as that for the alignment openings 16 in the sheet 10 and adhesive strip 12.

To assemble the sheets 10 into the bound volume shown in Fig. 4, the sheets are, as shown in Fig. 3, individually placed on the guide board 18 after the removable protective strip 14 has been removed from the sheet. The placement of a sheet on the guide board 18 is effected by passing the alignment holes 16 in each sheet over the correspondingly spaced guide pins 22 of the guide board 18. In this manner, the inner edges of the collected sheets 10 are accurately aligned with one another, and the adhesive strip 12b on the inner edge of the sheet 10b that was most recently placed over the guide pins 22 aligns with the inner edge and with the adhesive strip 12a on the previously arranged sheet, such as sheet 10a in Fig. 3.

The process is repeated for each sheet to be assembled and bound, and pressure is then applied to the assembled documents by any suitable means to cause the adhesive strip 12 on one sheet, say sheet 10a, to adhere to the underside inner edge of the immediately overlying sheet, here sheet 10b. The result is, as shown in Fig. 4, a permanently bound collection of sheets 10, which may, as shown, be encased within a cover 24 of a suitable rigid material.

It will be understood from the foregoing description of a preferred embodiment of the invention, that the collection of a plurality of sheets and documents can be assembled and permanently bound in a reliable, simple, and cost-effective manner. It will be further understood that modifications may be made to the embodiment specifically described without necessarily departing from the spirit and scope of the invention.